

WHAT IS CLAIMED IS:

- 1 1. A thermionic electric converter comprising:
2 a casing member;
3 a cathode within said casing member having a cathode emitter operable,
4 when heated, to serve as a source of electrons;
5 a target structure within the casing member comprising an anode operable
6 to receive electrons emitted from the cathode emitter; and
7 a cathode output enhancing device operable to increase an excitation
8 energy of electrons disposed at said cathode emitter.

- 1 2. A thermionic electric converter as set forth in Claim 1 wherein said
2 cathode output enhancing device comprises a cathode enhancing laser
3 positioned to direct a laser beam to strike an emissive surface of said cathode
4 emitter.

- 1 3. A thermionic electric converter as set forth in Claim 2, wherein said
2 cathode enhancing laser is positioned in the interior of said casing member.

- 1 4. A thermionic electric converter as set forth in Claim 3, wherein said
2 cathode enhancing laser is controlled by a rastering device operable to cause
3 the laser beam to sweep across said emissive surface of said cathode.

- 1 5. A thermionic electric converter as set forth in Claim 4, wherein said
2 rastering device is operable to cause the laser beam to sweep across
3 substantially the entire emissive surface of said cathode.

1 6. A thermionic electric converter as set forth in Claim 2 wherein said
2 cathode is positioned at a first side of said anode, and said cathode
3 enhancing laser is positioned at a second side of said anode opposite said
4 first side.

1 7. A thermionic electric converter as set forth in Claim 6, wherein said anode
2 has an opening therein to allow a laser beam emanating from said cathode
3 enhancing laser to pass therethrough.

1 8. A thermionic electric converter as set forth in Claim 7, wherein said
2 opening in said anode is located substantially in a center of said anode.

1 9. A thermionic electric converter as set forth in Claim 7, wherein said target
2 structure further comprises an electron repulsion ring positioned in the
3 opening in said anode, said electron repulsion ring having an opening
4 therethrough.

1 10. A thermionic electric converter as set forth in Claim 9, wherein said
2 electron repulsion ring is joined to said anode by an electrically insulating ring
3 positioned at an edge of said opening in said anode.

1 11. A thermionic electric converter as set forth in Claim 10, wherein said
2 electron repulsion ring is operatively coupled to a source operable to impose a
3 negative charge on said electron repulsion ring.

1 12. A thermionic electric converter as set forth in Claim 7 wherein said target
2 structure further comprises a highly statically charged ring disposed at an
3 outer periphery of said anode.

1 13. A thermionic electric converter as set forth in Claim 12 wherein said
2 anode and said highly statically charged ring are joined together via an inner
3 insulating ring, and wherein said highly statically charged ring has an outer
4 insulating ring adapted to mount said target structure inside said casing
5 member.

1 14. A thermionic electric converter as set forth in Claim 1, wherein said
2 cathode emitter comprises a wire grid having wires going in at least two
3 directions that are transverse to each other.

1 15. A thermionic electric converter as set forth in Claim 1, wherein said anode
2 is a substantially planar plate anode.

1 16. A thermionic electric converter as set forth in Claim 1, further comprising
2 an electron interference laser operable to hit electrons between the cathode
3 and anode.

1 17. A thermionic electric converter as set forth in Claim 2, further comprising
2 an electron interference laser operable to hit electrons between the cathode
3 and anode.

1 18. A thermionic electric converter as set forth in Claim 1 further comprising at
2 least one electret positioned within said casing member and being operable to
3 scavenge stray electrons present within said casing member.

1 19. A thermionic electric converter comprising:
2 a casing member;
3 a cathode within said casing member having a cathode emitter operable,
4 when heated, to serve as a source of electrons,
5 a target structure within the casing member comprising an anode
6 operable to receive electrons emitted from the cathode emitter;
7 a cathode enhancing laser positioned to direct a laser beam to strike an
8 emissive surface of said cathode emitter; and
9 a controller operable to raster said laser beam across said emissive
10 surface of said cathode emitter.

1 20. A thermionic electric converter as set forth in Claim 19, wherein said
2 cathode and said cathode enhancing laser are positioned on opposite sides of
3 said target structure, and
4 wherein said anode has an opening therein to allow a laser beam
5 emanating from said cathode enhancing laser to pass therethrough; and
6 wherein said target structure further comprises an electron repulsion ring
7 positioned at said opening in said anode, and a highly statically charged ring
8 extending around an outer periphery of said anode, operable to aid in
9 attracting electrons in said casing member toward said anode.

- 1 21. A thermionic electric converter as set forth in Claim 20, further comprising
- 2 an electron interference laser operable to hit electrons between the cathode
- 3 and anode.